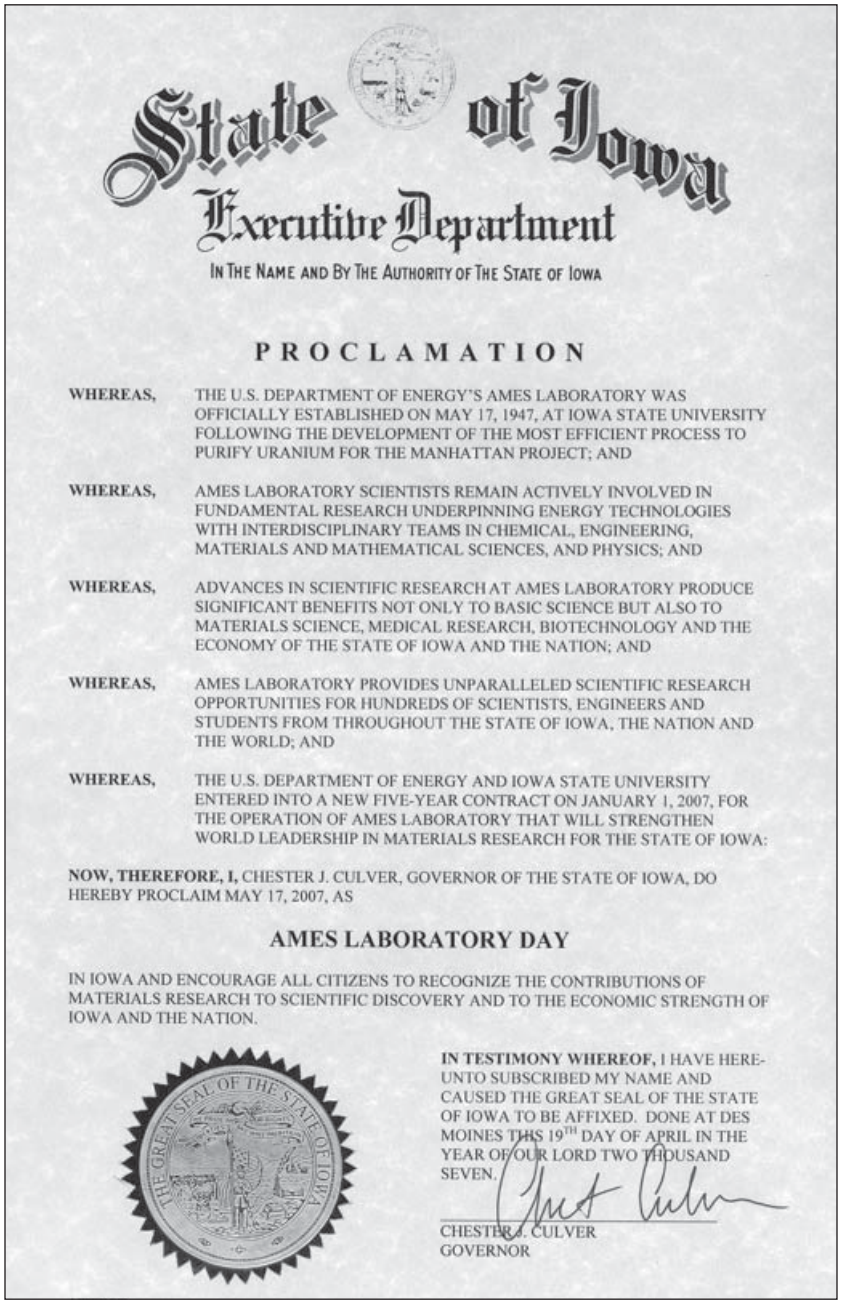
INSIDER

Newsletter for the Employees of Ames Laboratory ■ Volume 18, Number 5 ■ May 2007

Gov. Culver Proclaims May 17, 2007, Ames Laboratory Day in Iowa



State of Iowa

Executive Department

IN THE NAME AND BY THE AUTHORITY OF THE STATE OF IOWA

PROCLAMATION

WHEREAS, THE U.S. DEPARTMENT OF ENERGY'S AMES LABORATORY WAS OFFICIALLY ESTABLISHED ON MAY 17, 1947, AT IOWA STATE UNIVERSITY FOLLOWING THE DEVELOPMENT OF THE MOST EFFICIENT PROCESS TO PURIFY URANIUM FOR THE MANHATTAN PROJECT; AND

WHEREAS, AMES LABORATORY SCIENTISTS REMAIN ACTIVELY INVOLVED IN FUNDAMENTAL RESEARCH UNDERPINNING ENERGY TECHNOLOGIES WITH INTERDISCIPLINARY TEAMS IN CHEMICAL, ENGINEERING, MATERIALS AND MATHEMATICAL SCIENCES, AND PHYSICS; AND

WHEREAS, ADVANCES IN SCIENTIFIC RESEARCH AT AMES LABORATORY PRODUCE SIGNIFICANT BENEFITS NOT ONLY TO BASIC SCIENCE BUT ALSO TO MATERIALS SCIENCE, MEDICAL RESEARCH, BIOTECHNOLOGY AND THE ECONOMY OF THE STATE OF IOWA AND THE NATION; AND

WHEREAS, AMES LABORATORY PROVIDES UNPARALLELED SCIENTIFIC RESEARCH OPPORTUNITIES FOR HUNDREDS OF SCIENTISTS, ENGINEERS AND STUDENTS FROM THROUGHOUT THE STATE OF IOWA, THE NATION AND THE WORLD; AND

WHEREAS, THE U.S. DEPARTMENT OF ENERGY AND IOWA STATE UNIVERSITY ENTERED INTO A NEW FIVE-YEAR CONTRACT ON JANUARY 1, 2007, FOR THE OPERATION OF AMES LABORATORY THAT WILL STRENGTHEN WORLD LEADERSHIP IN MATERIALS RESEARCH FOR THE STATE OF IOWA:

NOW, THEREFORE, I, CHESTER J. CULVER, GOVERNOR OF THE STATE OF IOWA, DO HEREBY PROCLAIM MAY 17, 2007, AS

AMES LABORATORY DAY

IN IOWA AND ENCOURAGE ALL CITIZENS TO RECOGNIZE THE CONTRIBUTIONS OF MATERIALS RESEARCH TO SCIENTIFIC DISCOVERY AND TO THE ECONOMIC STRENGTH OF IOWA AND THE NATION.

IN TESTIMONY WHEREOF, I HAVE HERE-UNTO SUBSCRIBED MY NAME AND CAUSED THE GREAT SEAL OF THE STATE OF IOWA TO BE AFFIXED. DONE AT DES MOINES THIS 19TH DAY OF APRIL IN THE YEAR OF OUR LORD TWO THOUSAND SEVEN.

CHESTER J. CULVER
GOVERNOR

Secretary Bodman Sends Congratulations

Dear Alan Goldman:

Thank you for your kind invitation to join you for the 60th anniversary celebration of the Department of Energy's Ames Laboratory. I regret that due to scheduling conflicts, I cannot be with you on this important occasion.

I would like to take this opportunity to congratulate you and your colleagues on this milestone and to thank you for 60 years of outstanding service to our nation. I know that Ames Laboratory evolved from a wartime mission, and that today you have built on that wartime research to become one of the leading institutions worldwide in the study of the rare earths and their compounds. But even more impressive is the expansion of the Laboratory's research program into other areas of condensed matter physics and materials science, chemistry, biology, and high-performance computing.

As the focus of the Laboratory has broadened, you have not lost sight of the overall implications of your research, and you have continued to focus on the role that science can play in many of our nation's challenges. Your commitment to excellence has enabled you to recruit and nurture some of the very best scientists in the nation, and you have retained them despite the lure of other institutions. Together, these accomplishments make Ames Laboratory an outstanding success story.

I am pleased that the Ames Laboratory is a part of the Department of Energy. It is an honor to work with you and the Ames Laboratory team, and I look forward to learning about the scientific breakthroughs that are sure to come out of the Ames Laboratory in the next 60 years.

Congratulations and enjoy your 60th anniversary celebration.

Sincerely,

Samuel W. Bodman
Secretary of Energy

Ames Lab Featured on WOI Radio Show

Alan Goldman, Paul Canfield and Iver Anderson appear on "Talk of Iowa" program

The rich past and exciting future of Ames Laboratory came to life through the colorful comments made by Ames Laboratory scientists Alan Goldman, Paul Canfield and Iver Anderson during an interview on WOI radio's "Talk of Iowa" program on May 17. The appearance on "Talk of Iowa" coincided with the 60th anniversary of the Ames Laboratory and Iowa Gov. Chet Culver's proclamation that May 17, 2007, was Ames Laboratory Day in Iowa.

During the interview, Goldman, Ames Lab's interim director, explained how the Lab got its start working on the Manhattan Project. The legacy of that work, he said, is that Ames Lab continues to be "one of the premier materials science laboratories in the United States, if not in the world." Goldman called this "a very exciting time" for research at Ames Lab, commenting specifically on the addition of new research endeavors in such areas as photonic bandgap materials, metamaterials and bioinspired materials.

Asked about his recent testimony before the National Academy of Sciences, Canfield, Ames Lab senior physicist, told host Katherine Perkins he testified that there's an important need for new materials research in the United States as well as a need for the facilities and the ability to grow single crystals. Why single crystals? From a research point of view, Canfield explained that before using a material scientists need to know its basic properties.

"And if you're not looking at single crystals, often those properties are hidden," Canfield said. "If we want to be discovering the new materials that will enable the new technologies, this is where we need to invest," he emphasized.

Canfield's discussion of the importance of understanding the properties of materials in order to improve them and the creation of new materials was a perfect segue to comments by Iver Anderson, Ames Lab senior metallurgist, who began by discussing his research project that focuses on how to improve high-energy neodymium-iron-boron permanent magnets. If successful, he said this new class of high-energy magnets may find practical application in the drive motors of hybrid cars, "allowing them to have a higher operating temperature range and more power."

"Fascinating" was the word used by Perkins to characterize how the basic research scientists conduct in their labs can evolve into applications for everyday life.

Alan Goldman talks about the history of the Ames Lab.

She used as a second example Anderson's development of lead-free solder, which is now licensed for commercial use by more than 60 companies worldwide as an enviornmentally benign alternative to lead-based solders normally used in electronic appliances like cell phones and computers.

When asked by Perkins, "Why are you a scientist?" Canfield quickly responded that being a scientist is an "exquisite and privileged" life. "I can ask questions about nature, and I can see if nature answers," he said. On top of that, Canfield said, "Since we're at Iowa State University, we get to teach students, which is a delight."

"That's our legacy, that's what we really enjoy," echoed Anderson.

"What's the benefit of the Ames Lab to Iowa State University? It's the legacy we leave through our students and what we teach them," said Goldman.

To listen to an edited version of the WOI interview, go to www.ameslab.gov; click on "Ames Lab Featured on 'Talk of Iowa.'" ■

~ Steve Karsjen

"Talk of Iowa" host Katherine Perkins reacts to one of Paul Canfield's colorful science anecdotes.

Iver Anderson discusses his research on high-energy magnets.

Angelici Retires from Chemistry Dept.

After 44 years as a member of the Iowa State University chemistry faculty, Robert Angelici has retired from the university, but will continue as an Ames Lab associate scientist.

A Distinguished Professor of Chemistry, Angelici received his B.A. in chemistry from St. Olaf College in 1959 and his Ph.D. from Northwestern University in 1962. He has been a fellow of the Alfred P. Sloan Foundation and is past chair of the Organometallic Subdivision of the ACS Inorganic Division. From 1977 to 1981, he served as chemistry department chair. In 1985, he was chair of the Division of Inorganic Chemistry of the ACS, and in 1987, he was a Royal Society Guest Research Fellow in England. He was awarded the Governor's Science Medal in science teaching (1989).

"Most of my contributions to the work of the Lab have been in research and the education of graduate students and postdocs in research,"Angelici said. "I have tremendously enjoyed the challenges that go with research, and the Lab's support of our research has been extremely important to our success over the years, and I am grateful for that support."

One of the longest-running research efforts in which Angelici has been involved was the study of processes that lead to the removal of sulfur from the organic compounds in petroleum. ■

Gordon Receives IBM Faculty Award

Mark Gordon, program director of Applied Mathematics and Computational Sciences, has received a 2007 IBM Faculty Award for his work on perfecting quantum chemistry software models to run on IBM's Blue Gene® supercomputers.

The IBM Faculty Awards program is a competitive worldwide program with the goal of fostering collaborations between researchers at leading universities throughout the world and those in IBM research, development and service organizations.

The IBM Faculty Award of $40,000 will allow Gordon and his Ames Laboratory research group to continue their research, exploiting the full potential of GAMESS, a technical software program, and Blue Gene's immense computational horsepower. This will include interfacing with IBM researchers in Rochester, Minn., and Yorktown Heights, N.Y., where the Gordon group has already run several important benchmarks.

"Blue Gene is an important instrument of discovery for scientists across many disciplines," said Sam Ellis, Blue Gene development manager for IBM in Rochester, Minn. "We're pleased to recognize the work that professor Gordon's team has done on behalf of chemistry researchers around the globe."

The 2007 IBM Faculty Award extends the successful relationship Gordon and several members of his research group have had with IBM over the past 25 years. "It's been a tremendous, mutually beneficial relationship," said Gordon. "The benefits to us and to the entire computational chemistry community are that the relationship with IBM not only aids us in doing good science but also helps us in developing the GAMESS programs, which currently serve an estimated 100,000 users in more than 100 countries." ■

Program Reviews

Program reviews were held recently for both the chemical sciences (April 22-24) and materials sciences programs (May 9-11). The materials science review, which included the Condensed Matter Physics, and Materials Chemistry and Biomolecular Materials programs, was held in the ISU Molecular Biology Building. Poster sessions were held in the atrium, and dozens of presentations were on display, including work on new materials by John Corbett (inset).

Leading Sustainable Energy Researcher Visits

Nathan Lewis (center), George L. Argyros Professor of Chemistry at California Institute of Technology, meets with Ruth Shinar and Joe Shinar during his visit to Ames Lab. Lewis, a nationally-recognized expert on sustainable energy, was on campus to deliver the second-annual Presidential Lecture in Chemistry on May 15. His lecture was on "Scientific Challenges in Sustainable Energy Technology."

The Great Zinc Rethink

Physicists are tweaking zinc to get many model compounds

Although practitioners of the ancient art of alchemy failed in their attempts to turn base metals like lead into precious ones like gold and silver, one aspect of their misguided efforts survived. The zest these early "sorcerer scientists" exhibited trying to find ways to dramatically alter the properties of a material is alive and well today. Unlike their alchemist predecessors, however, present-day chemists and solid-state physicists pursue this passion according to scientific protocol, carefully making small changes in the composition of various compounds, especially ones that can be fine-tuned to extremes in behavior. Such is the challenge that entices the members of Ames Laboratory's novel materials group.

Versatile and cheap

Ames Laboratory physicists Paul Canfield and Sergey Bud'ko along with Shuang Jia, an ISU graduate student in the department of physics and astronomy, have discovered a fantastic range of properties in a new family of zinc compounds. Even though the compounds are over 85 percent zinc, they can be tuned, or manipulated, to take on some of the physical properties and behavior of other materials, ranging from plain old copper to more exotic elements like palladium, to even more complex electronic and magnetic compounds that are on, as Canfield says, "the hairy edge" of becoming magnetic (or even superconducting).

Their versatility makes the new zinc compounds ideal for basic research efforts to observe and learn more about the origins of phenomena such as magnetism. Basic research is the building block. Once scientists understand how these materials work, products and/or processes can follow.

Easy to tweak

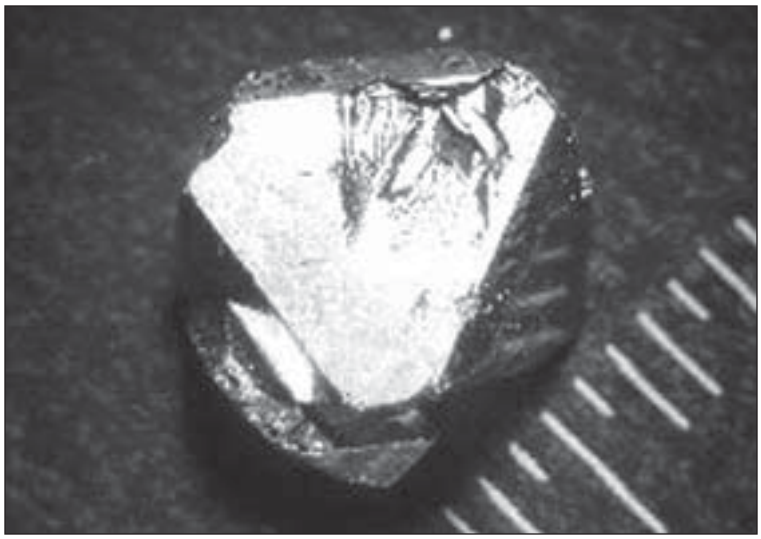
The unique aspect of the RT_2Zn_{20} (R=rare earth, T=transition metal, Zn=zinc) compounds' properties that Canfield, Bud'ko, and Jia discovered lies in the fact that they display extraordinary tunability. Indeed, these researchers have been able to make scores of different compounds with this "one rare earth-two transition metals-twenty zincs" formula.

"We can make compounds for up to 10 transition metals, and for each of those we can include between seven and 14 rare earths," says Canfield. "So that's between 70 and 140 compounds."

One of the compounds the researchers made, YFe_2Zn_{20} (Y=yttrium, Fe=iron, Zn=zinc), turned out to be even closer to being ferromagnetic than palladium, a nearly ferromagnetic material that scientists have traditionally studied to better understand magnetism.

Canfield, who is also an ISU Distinguished Professor Liberal Arts and Sciences in the department of physics and astronomy, describes palladium as a "runner-up" in terms of band magnetism – the magnetism of the common metals like iron, cobalt or nickel. These metals become ferromagnetic at such high temperatures that it's difficult to study them in detail, so palladium is the next-best option. In addition, palladium acts as a "before" picture to their "after" in terms of ferromagnetism.

"The problem is that as an element, palladium is a little hard to tune," says Canfield. "There is one palladium site, and it's not that versatile. For basic research as well as possible applied materials, you want compounds that allow for the manipulation of their properties. We can tune the rare earth-iron(2)-zinc(20), so we're able to push these compounds even closer to ferromagnetism and try to understand the consequences of this," he explains.



A single crystal of YFe_2Zn_{20} shown next to a mm scale. It grows in this shape naturally and has mirrored facets.

Substitution

Canfield, Bud'ko, and Jia have tuned the zinc(20) compounds by substituting on the rare earth site, for example, by exchanging yttrium for gadolinium. Canfield says, "It's like having a panicky crowd and someone yelling, 'Quick, run this way!' All of a sudden, everyone runs that way. That's what adding the gadolinium does – the compound just suddenly goes ferromagnetic at an unexpectedly high temperature."

The researchers can also tune the zinc(20) compounds by "playing" with the transition metal site. "By substituting cobalt for iron, we can back this material off," says Canfield. "The yttrium-cobalt-zinc(20) is about as ferromagnetic as copper, which means it's not. So we can calm the crowd down a little and see what happens."

The remarkable tunability of the new family of zinc(20) compounds is allowing Canfield, Bud'ko and Jia to approach the ferromagnetic transition point from where they hope to achieve another ambition – pushing the material to become ferromagnetic at very low temperatures by tweaking and tuning. "If we could do that," says Canfield, "then we could actually witness the birth of this type of small moment ferromagnetism—instead of just before and after pictures, we could watch the whole film."

Help is at hand

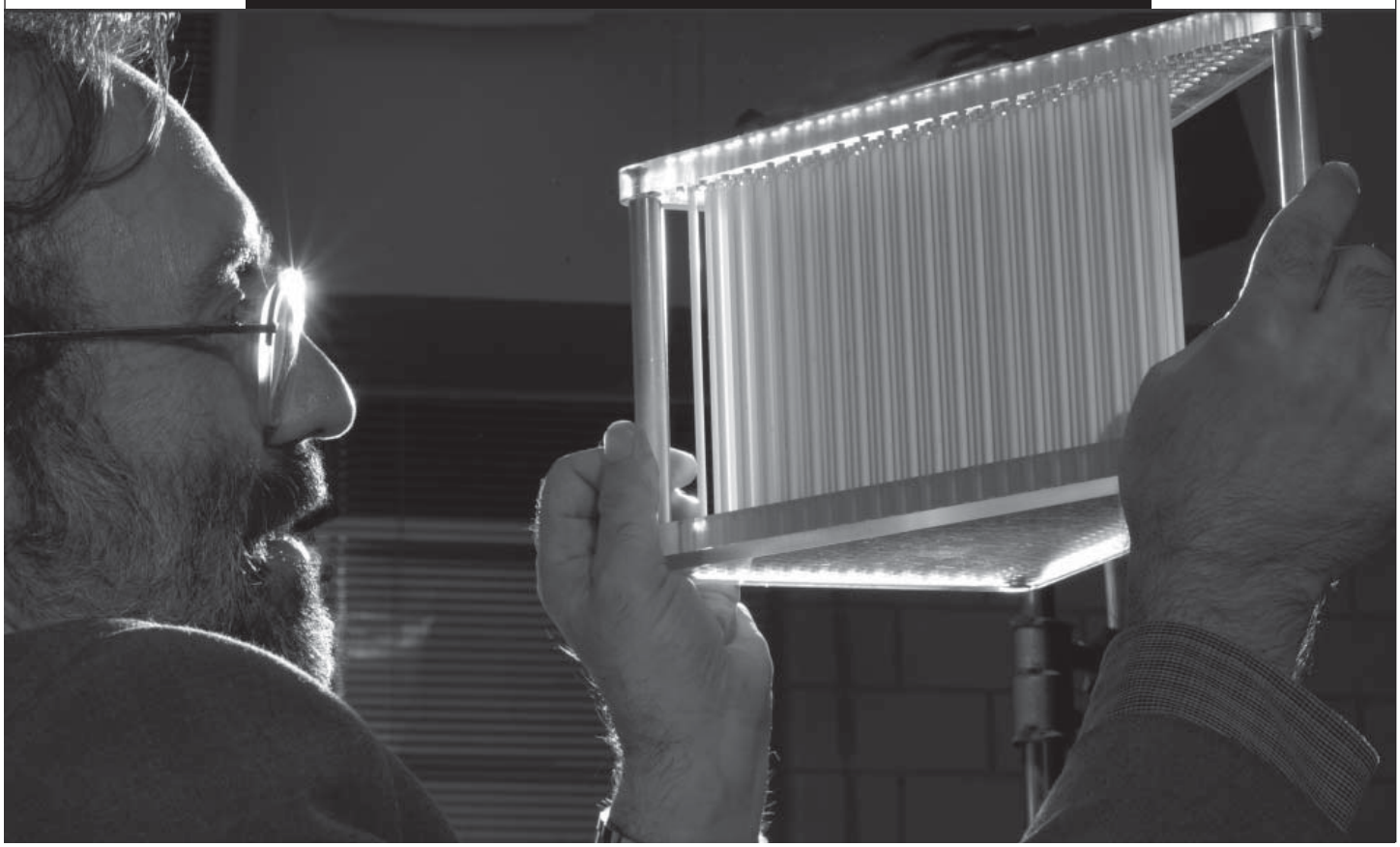
As they work toward that goal, Canfield and Bud'ko stress the importance of being able to draw on the skills and resources available at a Department of Energy lab. "Experimentally, it's very important to have design, synthesis and characterization very tightly linked," says Canfield. "You need to have your intrepid band of explorers able to investigate and contribute. Being in Ames gives us access to the world's highest purity rare earth elements. We need these to explore the effects of substitution on the rare earth site. And, in these nearly ferromagnetic materials, band structure calculations have been very important, so the structure expertise of our Ames Lab colleague German Samolyuk has been incredibly useful in helping us understand it and trying to figure out where the next moves are." ■

~ Saren Johnston

Ames Laboratory – Shaping Science for 60 Years

Ames Laboratory turned 60 years old officially on May 17, 2007. To help celebrate the Lab's achievements, *Insider* has featured a time line of significant Laboratory events that took place in each decade. The time line began with the 1940s in the November 2006 issue of the newsletter and concludes with the 2000s in this issue. The time line is based on historical documents and information taken from the various Ames Lab employee newsletters: *Insider*, *Changing Scene* and *Ames Laboratory News*.

1947 – 2007



Costas Soukoulis holds a photonic crystal designed to demonstrate negative refraction.

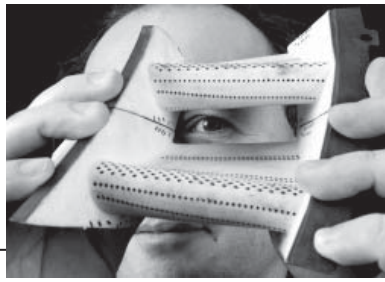
2000s

The 2000s – broadening the research scope

The symbiotic relationship of a national laboratory and a major research-oriented university allows Ames Laboratory to continue developing far more comprehensive research programs than might be expected from a national lab alone. The mission-oriented, interdisciplinary, collaborative research provides unique opportunities for both the Lab and Iowa State to broaden their research endeavors and maintain positions of international excellence as the two organizations move into the 21st century.

2000-02

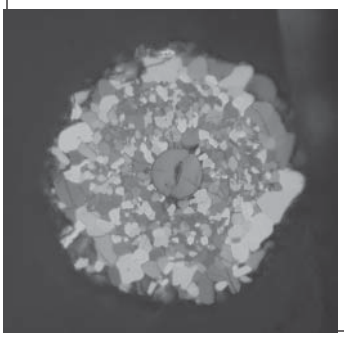
• The Ames Lab/ISU Regional High School Science Bowl celebrates its 10th anniversary in 2000.
•John Corbett receives the American Chemical Society's 2000 award for Distinguished Service in the Advancement of Inorganic Chemistry.
• Scientists at Ames Lab and IPRT host a workshop for forensic scientists from eight Midwestern states, a joint effort to establish a regional forensics research and support facility.
• An Ames Lab project to gain a better fundamental understanding of a unique class of alloys that responds powerfully to changes in temperature and magnetic field receives DOE funding over four years.
• The Materials Preparation Center launches the Process Science Initiative to probe the methods by which materials are synthesized to give them specific properties.
• Ames Lab expands its research on cluster computers thanks to a $300,000 Major Research Instrument grant.
• In 2001, Ames Laboratory research is recognized on the DOE Energy 100 Awards list three times. Number 24 on the top-100 list is photonic bandgap structures; number 36 is lead-free solder; and number 59 is magnetic refrigeration.
• Ames Laboratory receives a 2001 R&D 100 Award for a remarkable advance in chemical separation technology – multiplexed capillary electrophoresis using absorption detection. (Inventor: Ed Yeung)
• Ames Lab physicists are the first to describe the mechanism of superconductivity in magnesium diboride, map its properties and develop wire segments from the material.
• The Sept. 11, 2001, terrorist attacks stun the world. At Ames Laboratory, emergency response procedures go into operation. Director Tom Barton informs employees of the situation and asks that all nonessential personnel halt activities and vacate the Lab's buildings.
• Ed Yeung wins the 2001 American Chemical Society Award in Chromatography.



Brian Gleeson holds a turbine blade, one example of a component that may be greatly enhanced by Ames Lab's new bond coats for thermal barrier coatings.

2004

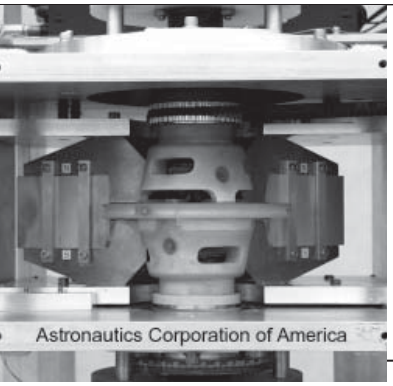
• Ames Lab researchers discover an unusual growth mode for lead on a silicon film that may prove critical in developing atomic structures for nanotechnology applications.
• Ames Laboratory physicists design and test a photonic crystal metamaterial to demonstrate negative refraction and superlensing in the microwave region of the electromagnetic spectrum.
• Ames Lab physicists add carbon to a superconducting compound, magnesium diboride, doubling the magnetic field the material can withstand.
• Ed Yeung is named the 2004 Iowa Inventor of the Year by the Iowa Intellectual Property Law Association.



Cross section of a carbon-doped magnesium diboride superconducting wire

2005

•Iowa Senator Tom Harkin announces $1.5 million in federal funding for Ames Laboratory's Midwest Forensics Resource Center.
• John Corbett receives the 2005 Spedding Award, the top honor for researchers in the field of rare-earth science.
• Ames Laboratory physicists and ISU materials science engineers begin designing and fabricating 3-D photonic crystal microstructures in the open air.
• Ames Laboratory and ISU host the 9th International Conference on Quasicrystals in May 2005.
• Ames Laboratory receives $1.6 million to study complex hydrides as part of the DOE's Hydrogen Fuel Initiative.
• Ames Laboratory wins a 2005 R&D 100 Award for innovative platinum-modified nickel- aluminide bond coats for thermal barrier coatings. (Inventors: Brian Gleeson and Dan Sordelet)
• Ames Lab receives $1 million in funding from the DOE for research in plant metabolomics.
• Costas Soukoulis wins the 2005 Descartes Prize for Excellence in Scientific Collaborative Research, the European Union's highest honor in the field of science.
• Ames Laboratory wins a 2006 R&D 100 Award for Texture-Based



First room-temperature permanent-magnet refrigerator

Blue OLED array

2003

- Ames Laboratory research results in a breakthrough technique using microscale channels cut in an ultrathin, biodegradable polymer to re-grow nerve cells.
- In 2003, R. Bruce Thompson is elected to the National Academy of Engineering for his outstanding contributions to nondestructive evaluation.
- The Federal Laboratory Consortium for Technology Transfer recognizes Ames Laboratory Director Tom Barton with its 2003 Laboratory Director of the Year Award.
- Ames Lab researchers discover a number of intermetallic compounds that are ductile at room temperature.
- In 2003, Ames Laboratory inaugurates the Middle School Science Bowl.

- Klaus Ruedenberg wins the 2001 American Chemical Society Award in Theoretical Chemistry
- Using materials developed at Ames Laboratory, researchers successfully demonstrate the world's first room-temperature, permanent-magnet refrigerator.
- Ames Laboratory receives $1.3 million through the DOE's Scientific Discovery through Advanced Computing, SciDAC, initiative to improve software for high-performance computing systems.
- In Jan. 2002, U.S. Rep. Tom Latham visits Ames Laboratory and announces $5 million in federal funding for two Lab initiatives – biorenewable energy and forensic research.
- Ames Laboratory research on the photophysics of luminescent organic thin films and organic light-emitting devices, OLEDs, leads to the development of a novel, integrated OLED/optical chemical sensor.

2006-07

Engineering Tools, TBET, that allows engineers to interact with large 3-D data sets to tackle complex engineering problems. (Inventors: Mark Bryden, Gerrick Bivins, and Doug McCorkle)

- Robert Angelici receives the 2006 American Chemical Society Award for Distinguished Service in the Advancement of Inorganic Chemistry.
- The Iowa Intellectual Property Law Association names Iver Anderson its 2006 Iowa Inventor of the Year.
- On Dec. 4, 2006, the U.S. Department of Energy announces that Iowa State University has won the bid to manage and operate the Ames Lab contract over the next five years.
- Tom Barton steps down as the director of Ames Laboratory and IPRT on Feb. 28, 2007.
- Alan Goldman becomes the Lab's interim director, effective March 1, 2007.

Tom Barton

- Karl Gschneidner, Jr. is named a member of the National Academy of Engineers in 2007.
- Ames Laboratory turns 60 on May 17, 2007.

Contract signing (seated, from left: ISU President Gregory Geoffroy and Marlene Martinez, acting DOE Ames Site Office manager; standing, from left: ISU Vice President Warren Madden, Ames Lab Director Tom Barton, DOE Source Evaluation Board Chair Pat Schuneman and Ames Lab division director, Mark Murphy)

Today

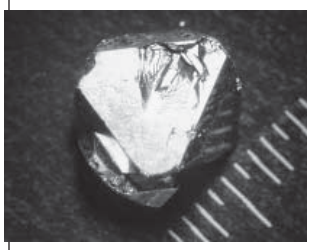
Ames Laboratory Today – the excellence continues

Today, Ames Laboratory scientists are carrying on the tradition of excellence that has shaped the Lab's research over the past 60 years. As they ask and answer fundamental questions in science, they help bring about technological advances in many areas that touch our daily lives.

Today

A sample being tested in the search for a palladium substitute for hydrogen fuel-cell technology

• Researchers are investigating various alloys in search of a palladium substitute that's critical for cost-effective hydrogen fuel-cell-powered vehicles. Palladium is expensive at $11,000 a kilogram, so efforts to find a material with the same properties as palladium that is cheaper and more abundant are key to unlocking the hydrogen fuel-cell "roadblock" for the 21st century.



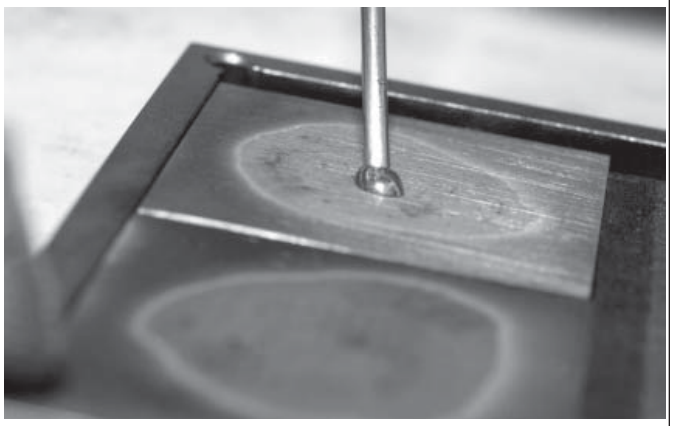
Single crystal of a new zinc compound

• Physicists have discovered a new family of zinc compounds that, even though they are over 85 percent zinc, can be tuned to take on some of the physical properties and behavior of other materials. Their versatility makes the new zinc compounds ideal for basic research efforts to observe and learn more about the origins of phenomena such as magnetism.

• A team of condensed matter physicists is the first to develop a material with a negative refractive index for visible light. Working with their colleagues in Karlsruhe, Germany, the Ames Lab team designed a silver-based, mesh-like material that marks the latest advance in the rapidly evolving field of metamaterials, materials that could lead to a wide range of new applications as varied as ultrahigh-resolution imaging systems and cloaking devices.

• A new research program, Simulation, Modeling and Decision Science, has been launched with a focus on helping engineers make faster and better design decisions. Researchers in the program create computer applications that convert large 3-D data sets into virtual models that perform just like real-world versions. Engineers can view and interact with the models on their computer screens or in a virtual-reality room.

• Metallurgists have enhanced the Lab's patented tin-silver-copper lead-free solder by adding zinc to improve the durability of solder joints, especially joints that have aged at high temperatures. Their work is advancing efforts to solve an ongoing problem with lead-free solder alternatives now available – the tendency to get brittle over time after repeated or prolonged heating cycles.



Ames Laboratory's zinc-enhanced lead-free solder

• Ames Lab researchers have found a way of using tiny silica particles called mesoporous nanospheres to deliver a dose of chemotherapy drugs to specific cancer cells without the risk of side effects to healthy cells.

• As it was during the first 60 years, Ames Laboratory today remains committed to focusing its diverse research strengths on issues of national concern, educating the next generation of scientists and engineers, and transferring technologies to industry.

Safer chemotherapy treatment

Ames Business Leaders Visit Ames Lab

Ames Chamber of Commerce Business After Hours event draws a crowd

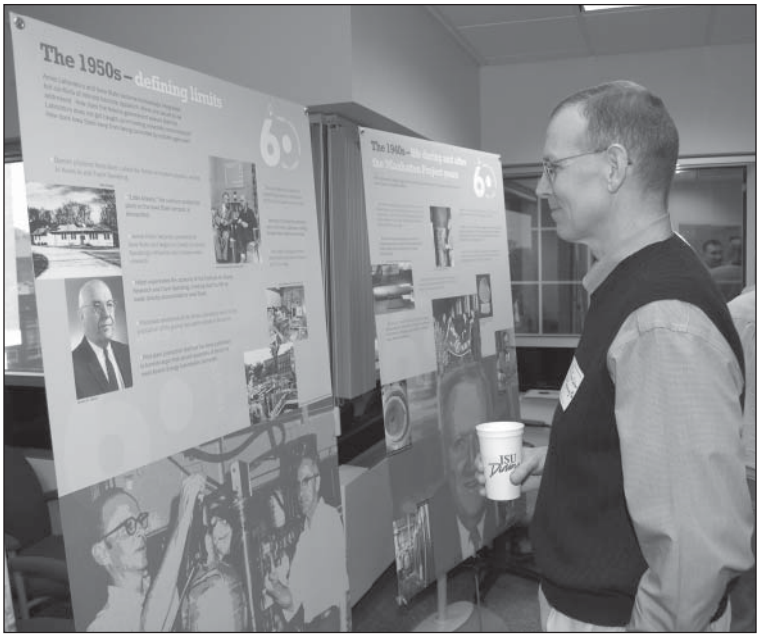
A large crowd of Ames business leaders gathered to help Ames Lab and the IPRT celebrate their 60- and 20-year anniversaries, respectively, at the Ames Chamber of Commerce Business After Hours event at Ames Lab on May 16.

Posters about the history of scientific innovation at Ames Lab and IPRT were on display, and Ames Lab scientists were on hand to talk to community members about the world-class research going on right now.

Alan Goldman, Ames Lab and IPRT interim director, welcomed guests with both a look back on the history of Ames Lab and a vision for the future.

"Ames Lab has been committed to outstanding science for the last 60 years, and we are committed to continuing outstanding science for the next 60 years," he said. ■

Ames business leaders gather to network and learn more about Ames Lab and IPRT.



An Ames Chamber member views the Ames Lab history timeline.

Alan Goldman talks with Dorothy Schumer of Travel and Transport, Inc.

Iowa City Regina Third in National High School Science Bowl Car Challenge

Regina Education Center of Iowa City finished third in the Hydrogen Fuel-cell Model Car Challenge at the U.S. Department of Energy's National High School Science Bowl®, April 26-30, and collected a check for $1,250 for their efforts. The money won by the Regina team will be used by their school to promote science in the classroom.

"The fuel-cell competition was great," said Josh Modrick, a senior who competed on the Regina team. "It provided a great opportunity to actually 'do' science."

The Regina team finished 18th overall in the 64-team academic competition portion for the National High School Science Bowl. ■

(From left) Members of the Regina team included Phil Ward, Wes Hottel, Vanessa Shiu, Peter Montag and Josh Modrick.

THE LINK

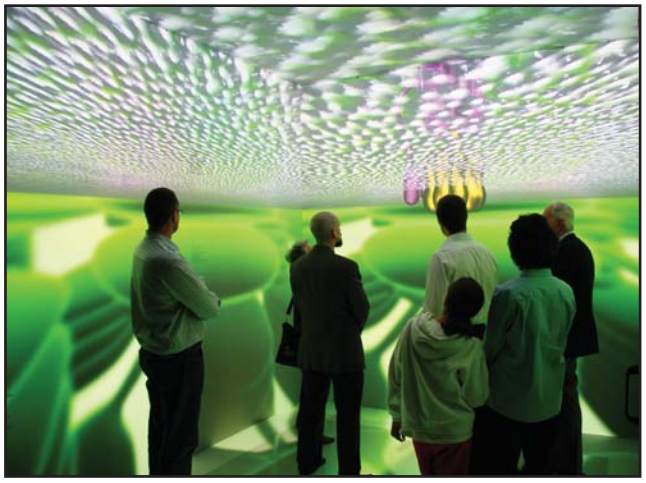
IPRT works for Iowa
1987 20 YEARS 2007

May 2007

News from the Institute for Physical Research and Technology

Upgraded Virtual Reality Room Wows Crowds

IPRT's Virtual Reality Applications Center opened its new and improved C6 virtual reality room during the Emerging Technology Conference 2007, held in April. The facility was open for public tours, and VRAC hosted an open house for the media.



VRAC's upgraded C6 virtual reality room was unveiled on April 29, 2007. The new system provides a world-record resolution of 100 million total pixels.

The new system wowed many visitors with its improved resolution and brightness. With 24 digital theater projectors, the system displays 100 million total pixels on its six surfaces, more than 16 times that of the old C6. With its other advances, the new C6 is set to support leading research in applications, such as developing control interfaces for the military's next generation of unmanned aerial vehicles, showing students how photosynthesis works and helping engineers visualize new products.

The three-day ETC conference also attracted a large audience. It featured several well-known speakers, including author Don Norman, fiction writer Neal Stephenson, start-up guru Guy Kawasaki, and database expert Raghu Ramakrishnan of Yahoo! Representatives from industry, including those from Deere & Company, Rockwell Collins, Microsoft and Infiscape, also gave presentations. Speakers from Mechdyne and Sony provided details on the technology breakthroughs behind the new C6. Throughout the conference, students from VRAC's Human Computer Interaction program held technology demonstrations.

VRAC Part of New CyberInnovation Institute

IOWA STATE UNIVERSITY CyberInnovation INSTITUTE

IPRT's Virtual Reality Applications Center is part of the new CyberInnovation Institute at Iowa State University. The purpose of the new institute, which recently received approval from the Board of Regents, is to strengthen ISU's research in information sciences and information technologies and leverage it to grow the state's economy.

The institute will enable interdisciplinary research teams to enhance research competitiveness and to collaborate with industrial partners. These partnerships span start-ups to well-established companies with a regional presence and expand the capacity for foundational research and new technologies. Research will address real-world problems in areas as diverse as the biological sciences, agriculture, engineering and business. Jim Oliver, VRAC director, will also serve as director of the new institute. Oliver says VRAC will remain part of IPRT.

Others members of the institute include the Center for Computational Intelligence, Learning, and Discovery (CCILD); the Center for Interfacial Engineering of MEMS2; the Information Assurance Center (IAC); the Information Infrastructure Institute (I^3); the National Science Foundation (NSF) International Materials Institute (CoSMIC-IMI); and VRAC's Human Computer Interaction initiative. For more information, see the intitute's Web site at www.cyberi.iastate.edu.

VRAC Hosts IPRT Advisory Board

Members of IPRT's Industrial Advisory Board got a sneak peek of the new C6, the virtual reality room built by IPRT's Virtual Reality Applications Center, during their spring meeting.

Awards

■ Iowa State University's Hans van Leeuwen (left), a professor of civil, construction and environmental engineering, and Jacek Koziel, a professor of agricultural and biosystems engineering, were awarded the Grand Prize for University Research from the American Academy of Environmental Engineers. The award recognizes their discovery of a more effective way of purifying alcohol using ozone and activated carbon. The work was done with Mello3z, a Cedar Rapids, Iowa, company. Lynne Mumm, an IPRT technology commercialization associate, assisted in the early critical stages of the project.

■ Bruce Thompson, director of IPRT's Center for Nondestructive Evaluation, has recieved the Research Award for Sustained Excellence from the American Society for Nondestructive Testing.

The IPRT LINK is published four times per year by the Institute for Physical Research and Technology at Iowa State University. Editor: Robert Mills. Please direct questions and comments to: Robert Mills, IPRT, 111 TASF, Iowa State University, Ames, IA, 50011; rmills@iastate.edu.,

SB Teams with Smithfield Foods and Denison, Iowa, Schools

Science Bound is extending its program to Denison, Iowa, through a partnership with Smithfield Foods and the Denison Community School District. The partnership will be driven by Learners to Leaders, a national educational alliance funded by Smithfield Foods and its independent operating companies. Smithfield Foods is underwriting the estimated $296,000 cost of the program, which will run from October 2007 through May 2012.

Learners to Leaders and Science Bound are selecting Denison students from eighth through 12th grade from disadvantaged backgrounds who have the potential to succeed in college. They include students who are part of ethnic groups that are considered underrepresented in the sciences. Beginning in October 2007, 10 to 15 eighth-grade students will be the first to participate in the Learners to Leaders program.

"We're excited to partner with Learners to Leaders in Denison and to have the opportunity to help students realize their potential and capacity to achieve academic excellence," says Connie Hargrave, Science Bound program director. "Science Bound's goal is to increase the number of diverse young people who pursue and earn science-related college degrees. Empowering and informing students and their parents about the necessary elements of preparing for and obtaining a college education are essential to meeting this goal," she says.

C. Larry Pope, president and chief executive officer at Smithfield Foods, says, "We have always been firm believers in giving back to our communities, and we can think of no better way than to bring educational opportunities to disadvantaged youth in Denison to help them achieve their dreams."

Happy 20th, IPRT!

IPRT is officially 20 years old on July 1, 2007. Highlights of IPRT's history have been on display recently as part of the Ames Laboratory's 60th anniversary time line. The time lines were displayed during VEISHEA as part of ISU's Sesquicentennial Village, the Ames Chamber of Commerce's Business After Hours, and the Ames Lab's 60th anniversary party. More displays of the timelines are in the works.

Ames Lab and IPRT to Hold Blood Drive

Ames Laboratory and IPRT will sponsor an American Red Cross blood drive, Friday, June 15, from 10 a.m. to 3 p. m. in 205 TASF. To donate blood or voluteer to assist with this worthwhile event, contact Carol Mack in Occupational Medicine, 4-2056, mack@ameslab.gov.

All donors and volunteers will receive a Summer Scratch Off Sweepstakes card for a chance to win FREE music, an iPod, a 40-inch flat-screen TV and more!

At last year's blood drive, Ames Lab and IPRT employees donated a total of 49 units of blood to the American Red Cross. Please help us exceed that amount by volunteering to donate blood on June 15.

DO GOOD. FEEL GOOD. GIVE BLOOD.

American Red Cross

Time for an I-Cubs Game

In honor of Ames Lab's 60th anniversary and IPRT's 20th anniversary, Public Affairs is organizing an outing to an Iowa Cubs game.

Date: Friday, June 15
Opposing team: Memphis Redbirds
Game Time: 7:05 p.m.
Cost: $6 per person (same for children)
Group seating: Grandstand, section 5 view seating chart at http://www.minorleaguebaseball.com//images/2007/03/01/prrVzRMG.jpg?sid=t451
Transportation: on your own
Post-game Fireworks: YES!

Contact Saren Johnston at 294-3474 or sarenj@ameslab.gov in Public Affairs, 111 TASF, to purchase tickets.

Method of payment: Cash in exact amount or checks made payable to Saren Johnston.

Tickets must be purchased by Tuesday, June 5, to allow time for mail delivery and distribution to employees.

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Editor Saren Johnston
Layout Breehan Gerleman

Address comments to:
Editor, ***INSIDER***
111 TASF
Ames, IA 50011-3020
515/294-9557
FAX 515/294-3226

Address correction requested
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